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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/501,117

01/14/2005

Takeo Okabe

OGOSH-19USA

5689

270 7590 01/06/2009

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EXAMINER

IP, SIKYIN

ART UNIT

PAPER NUMBER

1793

MAIL DATE

DELIVERY MODE

01/06/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/501,117	<b>Applicant(s)</b> OKABE ET AL.	
	<b>Examiner</b> Sikyln Ip	<b>Art Unit</b> 1793	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 27 October 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 3,4,7,8,16-19,23,24,27 and 28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 3,4,7,8,16-19,23,24,27 and 28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 3, 4, 7, 8, 16-19, 23-24, 27, and 28 are further rejected under 35 U.S.C.

§ 103 as being unpatentable over JP 06-177128 in view of USP 6451135 to Takahashi et al.

JP 06-177128 discloses the features including the claimed Al containing Cu alloy and resistivity (abstract). The Cu alloy is formed by sputtering ([0010]-[0011]). JP 06-177128 does not disclose the recited x-ray diffraction ratio and grain size. However, Takahashi discloses to control grain size (col. 2, lines 35-38), x-ray diffraction ratio (col. 2, lines 39-44), and processing steps (col. 5, Example 1) in the same field of endeavor or the analogous metallurgical art for uniformity of film thickness (col. 2, lines 25-28). Therefore, it would have been obvious to one having ordinary skill in the art of the cited references at the time the invention was made to control grain size and x-ray diffraction ratio as taught by Takahashi because the set forth benefits and function entail the motivation of one skilled in the art to make a claimed sputtering target, in the expectation that compounds similar in structure will have similar properties. In re Venner, 120 USPQ 193 (CCPA 1958), In re LaVerne, et al., 108 USPQ 335, and In re Aller, et al., 105 USPQ 233. In re Gyurik, 596 F.2d 1012, 1018, 201 USPQ 552, 557 (CCPA 1979); See In re May, 574 F.2d 1082, 1094, 197 USPQ 601, 611 (CCPA 1978) and In re Hoch, 57 CCPA 1292, 1296, 428 F.2d 1341, 1344, 166 USPQ 406, 409 (1970).

### ***Response to Arguments***

Applicant's arguments filed October 27, 2008 have been fully considered but they are not persuasive.

(i) The disclosure provided by the Takahashi et al. reference expressly teaches away

Applicants argue that “from the composition of the thin film and sputtering target disclosed by JP '128 and that required ”

But, applicants fail to provide factual evidence that the claimed diffraction ratios would not be overlapped by pure Cu sputtering target of Takahashi. Takahashi is merely cited

to show that the claimed grain size is known for Cu sputtering target and the recited diffraction ratios is mainly from copper element.

Applicants argue that the reason to combine the JP '128 and Takahashi is merely a conclusory statement. But, applicants did not argue the teaching of Takahashi would not obtain uniformity of film thickness or the benefit would not be wanted by JP '128.

~~Turning to JP '128, its disclosure is almost exclusively directed to a thin film, not a sputtering target or its method of manufacture. For example, the only reference at all in JP '128~~

Applicants argue that “~~with respect to a sputtering target is in Paragraph No. 0010 of JP '128. This paragraph merely-~~” JP '128 forms Cu-Al alloy thin film by sputtering method in semiconductor device. Instant

Claim 3 (previously presented): A sputtering target for forming a seed layer of a semiconductor device, comprising: a copper alloy sputtering target containing 0.2 to 5 wt% of Al ” uses Cu-Al alloy claims 3, semiconductor device, comprising: a copper alloy sputtering target containing 0.2 to 5 wt% of Al ” uses Cu-Al alloy sputtering target to form seed layer of a semiconductor device. The instant cited intended-use reads on thin film of JP '128. Nonetheless, the Cu-Al alloy thin film is formed by sputtering. Cu-Al alloy in JP '128 is a sputtering target material before forming a thin film.

Applicants argue that the cited references fail to disclose step to exclude precipitates. But, applicants fail to point out where cited references disclosing precipitates.

Applicants' argument with respect to the “underwater cooling step” in page 12 of instant remarks is noted. But, the claimed I(111)/I(200) ratio is anticipated by teaching of Takahashi (abstract). Moreover, applicants fail to provide persuasive reason why “thin film wiring copper alloy” of JP '128 cannot be used as a seed layer of a semiconductor device.

~~438.~~—This is because the sputtering film of JP '128 is required to be subjected to oxidation treatment causing the Al or Si to diffuse to the surface layer of the copper wiring. Thus, the thin film of JP '128 is not uniform and uniformity is not desired. Further, the Al or Si content of JP '128 is required to be concentrated on the layer of the wiring to form a barrier layer, and there is substantially no Al or Si content in the pure center section of the wiring required by JP '128. Accordingly, there is no common sense reason for one of ordinary skill in the art to adjust the

Applicants argue that “ crystal orientation or uniformity of JP '128. ” But,

applicants fail to provide factual evidence to substantiate their position.

Applicants' argument in page 15, last paragraph of instant remarks is noted. But, grain size and diffraction ratio are result effective variable. Discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

## Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. USP 6391163 to Pavate et al is cited to show that the claimed Cu-Al sputtering target (col. 3, lines 20-29), resistivity (col. 1, lines 29-36), grain size (col. 3, lines 1-4), and x-ray diffraction ratio are parameters known to be optimized by known methods.

Applicant is reminded that when amendment and/or revision is required, applicant should therefore specifically point out the support for any amendments made to the disclosure. See 37 C.F.R. § 1.121; 37 C.F.R. Part §41.37 (c)(1)(v); MPEP §714.02; and MPEP §2411.01(B).

## Examiner Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to S. Ip whose telephone number is (571) 272-1241. The examiner can normally be reached on Monday to Thursday from 5:30 A.M. to 4:00 P.M.

Art Unit: 1793


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Roy V. King, can be reached on (571)-272-1244.

The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

/Sikyin Ip/

Primary Examiner, Art Unit 1793

January 4, 2008

<b><i>Application Number</i></b> 	<b>Application/Control No.</b>	<b>Applicant(s)/Patent under Reexamination</b>	
	10/501,117	OKABE ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Sikyln Ip	1793	